

**COMPRESSED GAS**

**& AIR SAFETY**

CALIFORNIA STATE UNIVERSITY, LOS ANGELES  
ENVIRONMENTAL HEALTH AND SAFETY OFFICE

1999

## TABLE OF CONTENTS

- 1.0. PURPOSE
- 2.0. ORGANIZATIONS AFFECTED
- 3.0. REFERENCES
- 4.0. POLICY
- 5.0. DEFINITONS
- 6.0. RESPONSIBILITIES
- 7.0. PROCEDURES
- 8.0. APPENDICES

### 1.0. PURPOSE:

The purpose of this program is to establish a uniform set of guidelines for the use of compressed gas and air at California State University, Los Angeles. It will provide information regarding the required proper use, inspection, training, and record keeping governing these devices.

### 2.0. ORGANIZATIONS AFFECTED:

All University departments and personnel.

### 3.0. REFERENCES:

California Code of Regulations, Title 8, Subchapter 7. General Industry Safety Orders, Group 2. Safe Practices and Personal Protection, Article 7. Miscellaneous Safe Practices, Sections: 3301, 3304, 3305, 3306, 4649, and 4657.

### 4.0. POLICY:

It shall be the policy of California State University, Los Angeles to protect employees, faculty, staff, students and the general public from any exposure to hazardous materials and/or processes used at the campus. The focus of the program shall be to diminish the possibility of any risks, accidental injury,

or illness. Each area that uses compressed gas and/or air shall be provided with the proper materials, equipment, and training in accordance with federal, state and local requirements.

**5.0. DEFINITIONS:**

**6.0. RESPONSIBILITIES:**

- 6.1. The President - Ultimate responsibility for the implementation of the Compressed Gas and Air Safety Program rests with the University President.
- 6.2. Office of Environmental Health and Safety - Shall maintain the Compressed Gas and Air Safety Program. They shall oversee the required proper use, inspection, training, and record keeping governing these devices.
- 6.3. Affected Departments - Shall conduct inspections and oversee maintenance of all equipment and training of personnel.
- 6.4. Public Safety - Report hazardous incidents to the Environment Health Hazard Safety Office. Serve as a first responders to emergencies and criminal events as necessary.
- 6.5. Staff, Faculty, and Students – Shall abide by all applicable aspects of this safety procedure.

**7.0. PROCEDURES:**

7.1. General:

- 7.1.1. Cylinders received from suppliers shall be in good condition and contents clearly identified.
- 7.1.2. Valve protection caps, in cases where the cylinder is designed to accept a cap, shall always be in place, hand-tight, except when cylinders are in use or connected for use.
- 7.1.3. Cylinders shall be conveyed by suitable trucks or dollies to which they are securely fastened.
- 7.1.4. Cylinders in storage and in service shall be securely held in substantial racks or secured to other rigid structures in a

vertical position so that they will not fall or be knocked over.

- 7.1.5. Cylinders should be stored so that they are not allowed to reach an excessive temperature.
- 7.1.6. Cylinders shall not be dropped or struck or permitted to strike each other violently.
- 7.1.7. Valve protection caps shall not be used for lifting cylinders; nor shall ropes, chain slings, or magnets be used.
- 7.1.8. Cylinders shall never be used as rollers or supports.
- 7.1.9. No person other than the gas supplier, shall attempt to mix gases in a cylinder. No one except the supplier of the cylinder, or person authorized by him, shall refill a cylinder.
- 7.1.10. No one shall tamper with valves or safety devices on cylinders.
- 7.1.11. A hammer, wrench, or other tool shall not be used to open cylinder valves. If valves cannot be opened by hand, the supplier shall be notified. (EXCEPTION – Acetylene cylinders are provided with a nonadjustable wrench, and only the wrench provided shall be used. This wrench must be left on the valve when the protective cap is not in place.
- 7.1.12. Exhausted cylinders shall be stored separately from full cylinders.
- 7.1.13. Valves shall be closed when cylinders are not in use.
- 7.1.14. Cylinders must not be placed where they might form part of an electric circuit.
- 7.1.15. Cylinder valves shall be closed when work is finished.

**7.2. Do not use compressed gasses to:**

- 7.2.1. blow dirt, chips, or dusts from clothing when the pressure is greater than 10 pounds per square inch.
- 7.2.1. empty containers of liquids when the gas pressure is greater than the safe working pressure of the container.

7.2.2. elevate or transfer a hazardous substance from one container to another unless both containers are designed to withstand four times the pressure of the gas. Equip abrasive blast cleaning nozzles with an operating valve that must be held open by hand.

7.3. Compressed Cylinder Gas:

7.3.1. When using compressed gas to test a pressure vessel, install a pressure relief device in the supply line of the vessel being tested.

7.3.2. Do not use compressed gas from a cylinder or cylinder manifold where dangerous pressures may develop, unless an accepted pressure regulating device is installed.

7.3.3. Oxygen cylinders shall never be stored near highly combustible materials, especially oil and grease, or near any other substance likely to cause or accelerate fire.

7.3.5. Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials by a minimum distance of 20 ft, or by a noncombustible barrier at least 5 ft high having a fire-resistance rating of at least one-half hour.

7.3.6. Compressed Oxygen – Do not use compressed oxygen:

to purge pipelines, tanks, or any confined areas;

to supply head pressure in tank;

in pneumatic tools;

in oil preheating burners;

to start internal combustion engines;

for ventilation;

for dusting clothing; and

in any other way as a substitute for compressed air.

7.4. Salvaging Pressure Vessels:

- 7.4.1. Do not process pressure vessels for salvage until it is certain that they do not contain hazardous substances and are not under pressure.
- 7.4.1. Before opening closed pressure vessels or other containers, know what they contain and take precautions to avoid risk of injury.

7.5. Construction and Marking of Cylinders:

- 7.5.1. All portable cylinders used for the storage and shipment of compressed gases shall be constructed and maintained in accordance with the regulations of the U. S. Department of Transportation 49 CFR Parts 171-179.
- 7.5.2. Compressed gas cylinders shall be equipped with what are approved as defined in Section 3206 of the General Industry Safety Orders.
- 7.5.3. All cylinders with a water weight capacity of over 30 pounds shall be equipped with means of connecting a valve protection device or with a collar or recess to protect the valve.
- 7.5.4. Compressed gas cylinders shall be legibly marked, for the purpose of identifying the gas content, with either the chemical or the trade name of the gas. Such markings shall be by means of stenciling, stamping, or labeling, and shall not be removable. Whenever practical, the marking shall be located on the shoulder of the cylinder.

NOTE: This method conforms to ANSI Z48.1954(R1971), "Method for Marking Portable Compressed Gas Containers to Identify the Material Contained."

- 7.5.5. The numbers and markings stamped into cylinders shall not be tampered with.

7.6. Storage of Cylinders

- 7.6.1. Cylinders of compressed gas shall be stored in areas where they are protected from external heat sources such as flame

impingement, intense radiant heat, electric arc, or high temperature steam lines.

- 7.6.2. Inside of buildings, cylinders shall be stored in a well-protected, well-ventilated, dry location, at least 20 feet from highly combustible materials such as oil or excelsior. Assigned storage spaces shall be located where cylinders will not be damaged by passing or falling objects, or subject to tampering by unauthorized persons.

NOTE: Cylinders should be stored in definitely assigned places away from elevators, stairs, or gangways.

- 7.6.3. Cylinders shall not be kept in unventilated enclosures such as lockers and cupboards.

EXCEPTION: Cylinders of fire suppressant gases.

- 7.6.4. Oxygen cylinders shall never be stored near highly combustible materials, especially oil and grease, or near any other substance likely to cause or accelerate fire.

- 7.6.5. Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials by a minimum distance of 20 ft, or by a noncombustible barrier at least 5 ft high having a fire-resistance rating of at least one-half hour.

- 7.6.6. Compressed gas cylinders shall be stored or transported in a manner to prevent them from creating a hazard by tipping, falling or rolling. Liquified fuel-gas cylinders shall be stored or transported in a position so that the safety relief device is in direct contact with the vapor space in the cylinder at all times.

- 7.6.7. All cylinders which are designed to accept valve protection devices shall be equipped with such devices when the cylinders are not in use or connected for use.

- 7.6.8. Unless cylinders are secured on a special truck or rack, regulators shall be removed and valve-protection devices, when provided for, shall be put in place before cylinders are moved.

- 7.6.9. Compressed gas cylinders in portable service shall be conveyed by suitable trucks to which they are securely fastened; and all gas cylinders in service shall be securely

held in substantial racks or secured to other rigid structures so that they will not fall or be knocked over.

**EXCEPTION:** When it is not practicable to transport cylinders by truck, nor to bring in racks to point of operation, as in some construction work, cylinders may be carried in, and properly secured in an adequate manner. For short distances, cylinders may be moved by tilting and rolling them on their bottom edges.

7.6.10. Gas cylinders transported by crane, hoist or derrick must be handled in suitable cradles, nets or skip boxes, and shall never be lifted by magnet or by slings, unless the slings are designed and constructed to prevent accidental release of the cylinders.

7.6.11. Valve protection devices shall not be used for lifting cylinders.

**EXCEPTION:** Valve protection devices may be used for manual lifting if they were designed for that purpose.

7.6.12. Bars shall not be used under valves or valve protection caps to pry cylinders loose when frozen to the ground or otherwise fixed; the use of warm (not boiling) water is recommended.

**NOTE:** Valve protection devices are designed to protect cylinder valves from damage.

7.6.13. Cylinder valves shall be closed before moving cylinders.

7.6.14. Cylinder valves shall be closed when work is finished.

7.6.15. Valves of empty cylinders shall be closed.

7.6.16. Cylinders shall not be dropped or struck or permitted to strike each other violently.

7.6.17. Cylinder valves not provided with fixed handwheels shall have keys or handles on valve spindles or stems while cylinders are in service. In multiple cylinder installations only one key or handle is required for each manifold.

7.6.18. Leaking regulators, cylinder valves, hose, piping systems, apparatus and fittings shall not be used.

**NOTE:** (1) Cylinder valves shall not be tampered with nor



should any attempt be made to repair them. If trouble is experienced, the supplier should be sent a report promptly indicating the character of the trouble and the cylinder's serial number. Supplier's instructions as to its disposition shall be followed.

NOTE: (2) Complete removal of the stem from a diaphragm-type cylinder valve shall be avoided.

7.6.19. Cylinders shall never be used as rollers or supports, whether full or empty.

7.6.20. Cylinders must not be placed where they might form part of an electric circuit.

7.6.21. No one shall use a cylinder's contents for purposes other than those intended by the supplier.

7.6.22. Acetylene shall never be brought into contact with unalloyed copper, except in a blowpipe or torch.

7.6.23. When flammable gas lines or other parts of equipment are being purged of air or gas, open lights or other sources of ignition shall not be permitted near uncapped openings.

## 8.0. APPENDICES: